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E73-10504) WATER SURVEY OF CANADA:  
APPLICATION FOR USE OF ERTS-A FOR  
RETRANSMISSION OF WATER RESOURCES DATA  
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Water Survey of Canada  
Application for Use of ERTS-A for  
Retransmission of Water Resources Data

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April, 1973

Type I Report for Period October, 1972 to March, 1973

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<b>4. Title</b> Water Survey of Canada: Application for Use of ERTS-A for Retransmission of Water Resources Data		<b>5. Report Date</b> April 1973
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<b>9. Name and Address of Principal Investigators Organization</b> Applied Hydrology Division Division Dept. of Environment, No. 8 Temporary Bldg 870 Carling Avenue Ottawa, Ontario, Canada K1A 0E7		<b>10. Principal Investiga.Rept.No</b>
<b>12. Sponsoring Agency Name and Address</b> Dept. of the Environment No. 8 Temporary Bldg 870 Carling Avenue Ottawa, Ontario, Canada K1A 0E7		<b>11. GSFC Technical Monitor</b> George Ensor  <b>13. Key Words (Selected by Principal Investigator)</b> Data retransmission Water level, ice movement Real time
<b>14. Supplementary Notes</b>		
<b>15. Abstract</b> <p>Eight platforms have been installed and are now operating successfully. Water level data are transmitted from all DCPs and ice movement indicator data are transmitted from two DCPs. Six operating platforms transmitted over 7000 correct water level readings in 1972. All Canadian DCP data are available on a near real time basis through the Canada Center for Remote Sensing in Ottawa.</p>		

Type I Progress Report for Period  
October 1, 1972 to March 31, 1973

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1. Accomplishments.

a) DCP 6366 and water level encoder installed on Mackenzie River at Norman Wells (Lat.  $65^{\circ} 17'$  - Long.  $126^{\circ} 51'$ ) and activated October 11, 1972.

b) DCP 6232 and water level encoder installed on Albany River above Nottick Island (Lat.  $51^{\circ} 38'$  - Long.  $86^{\circ} 24'$ ) on October 12, 1972. This DCP did not transmit and was replaced with 6102 on January 13, 1973. At that time it was noticed that there was a loose wire on the antenna. When this wire was attached to the dipole, 6102 began transmitting normally.

c) DCP antenna and water level encoder installed on Winisk River below Asheweig River Tributary (Lat.  $54^{\circ} 31'$  - Long.  $87^{\circ} 14'$ ) October 14, 1972. DCP 6137 which had been sent to Daytona Beach for repairs, was installed and activated on February 21, 1973.

d) DCP 6125 and water level encoder installed on Duncan River below B.B. Creek (Lat.  $50^{\circ} 38'$  - Long.  $117^{\circ} 03'$ ) and activated October 25, 1972.

e) DCP 6260 and water level encoder installed on Mackenzie River at Fort Simpson (Lat.  $61^{\circ} 52'$  - Long.  $121^{\circ} 21'$ ) and activated October 31, 1972.

f) The problem with DCP 6353 reported on in the first Type I report was found to be in the water level encoder, not in the DCP.

g) Two Fisher & Porter interfaces which would enable transmission of precipitation data in parallel digital mode have been purchased and will be installed during the next reporting period.

h) Ice movement indicators have been made up for installation at four DCP sites. The indicators are of two types - one uses an entire analogue word; the other uses one bit in parallel digital. Analogue indicators were installed in DCP 6102 and DCP 6137 in March 1973.

i) DCP data can now be received by Canadian users via teletype on a near real time basis. The system was set up by the Canada Center for Remote Sensing.

## 2. Major Problems

No major problems were encountered although two problems arose with respect to processing the DCP punch cards.

a) Our computer programme for reading the punch cards was written with the expectation that day one in 1973 would appear as 001 not --1. This resulted in incorrect dates being printed out with the water level data.

b) Some cards from about day 72 to 76 in 1973 had punches that were skewed slightly. Our card reader would not accept them, therefore making it necessary to re-punch about 50 cards.

## 3. Significant Results

a) Over 7000 transmissions were received from six operating DCPs in 1972. Of these, only two were incorrect. One had the wrong date and the other had an invalid digit in the water level reading (the hundredths). Extensive checks have indicated that DCP data are accurate.

b) The maximum number of transmissions received each day varies from 26 to 12 and the minimum from 10 to 3 depending on the site. Data has been received on as many as seven orbits in a day. The number of transmissions received from the two DCPs located in mountainous areas of southern B.C. is lower than the number received from more northerly but more open sites.

c) All data received at Greenbelt from the B.C. stations are also received at Goldstone.

d) The unheated DCPs have survived temperatures of  $-40^{\circ}\text{F}$  and antenna loadings of two feet of snow and wind speeds over 50 mph.

e) Two DCPs have indicated sensor malfunctions thus alerting field staff to the fact that repairs will be necessary on their next visit to the site. Also in another case, DCP data were used to fill in a period of missing record when a water level recorder malfunctioned for a few days.

#### 4. Significant Changes in Operating Procedures

a) It has been decided not to install DCP 6232 on the Kootenay River at Fort Steele. Instead this platform will be installed on the Nahatlatch River below Tachewana Creek (Lat.  $49^{\circ} 57'$  - Long.  $121^{\circ} 52'$ ) in the Fraser River basin where real time water level data would be extremely valuable for flood forecasting purposes.

#### 5. Published Articles or Papers

a) The first Type I report for this project was published by NASA.

b) A short paper entitled "Data Retransmission from Water Survey of Canada Gauging Stations Using ERTS-1" was presented to the Ontario District Conference of the Water Survey of Canada at Guelph, Ontario on January 25, 1973.

#### 6. Recommendations

None at present. Water Survey of Canada personnel are interested in obtaining additional platforms.